AMERICAN JOURNAL OF

Veterinary Medicine

SUCCESSOR TO

Missouri Valley Veterinary Bulletin

GIVES MOST FOR THE MONEY, BOTH TO THE READER AND THE ADVERTISER

PUBLISHED MONTHLY BY

D. M. CAMPBELL, D. V. S.,

1926 Wilson Ave., Chicago, Ills.

Entered as Second-Class Matter July 19, 1910, at the Post Office at Chicago, Illinois, under the act of Congress of March 3, 1879.

VOL. VI. FEBRUARY, 1911 No. 2

Leading Articles

Practical Application of Bacterins

By A. T. KINSLEY, M. Sc., D. V. S.

The therapeutic application of biologic products is becoming more and more extensive.

When one considers the large number of biologic products that have been highly lauded as efficient, and on a more careful perusal finds only relatively few such agents now in use, it creates an inquiry as to the cause of this state of affairs. The answer is easy when one remembers the erratic tendency of medical men in their use of therapeutic agents and the experimental tendency of practitioners. Again *some* drug manufacturers are not scrupulous in their advertising.

Bacterins, like many other biologic therapeutic agents, have been over-advertised, their therapeutic value has been over-estimated and this is going to result in disappointment not only to the practitioner, but also to the producers. The disappointment to the practitioners will be due to the fact that the bacterins will not produce the results some advertisers would lead one to expect in all the pathologic conditions in which they have been recommended. To the producer there will be disappointment because of the fact that the demands for bacterins in the veterinary prac-

tice will be less than at the present. However, if the proper precautions are heeded by the manufacturers and the practitioners use bacterins only in conditions in which they are of therapeutic value, they will be classified as an essential remedial agent by the therapeutists and will be found in the medicine case of all successful practitioners.

Bacterin is a biologic product the essential ingredient of which is dead and disintegrated bacteria. The active principle of bacterins is probably always an endotoxin. The terms bacterin and vaccine should not be used interchangeably, as a vaccine is an attenuated virus, the immunizing property of which depends on the fact that the vaccine produces a mild form of the disease in the vaccinated animal. The immunizing properties of a bacterin depends upon the fact that the endotoxin produces, or causes to be produced, opsonins in the inoculated animal, the opsonins in turn increase the power of the leucocytes in destroying the same type of bacteria that were used in the preparation of the bacterin. For example, a bacterin prepared from the Staphylococcus pyogenes aureus, introduced into the animal body, will cause that animal body to produce opsonins, which in turn enable the leucocytes in that animal body to destroy the living active Staphylococcus aureus.

Theoretically bacterins are indicated in all conditions resulting from infection with bacteria that produce endotoxins, providing that other products as bacterial toxins or bacterial proteids are not in sufficient quantity to offset the beneficial influence of the endotoxin. Up to the present time it has been shown clinically that bacterins may be successfully used in diseases or diseased conditions caused by infection with staphylococci, streptococci and colon bacillus, they are of value in typhoid, tubercular and glanderous infections and possibly also in hog cholera. It is possible that other infective diseases may later be controlled by the use of such products. The following suppurative conditions are benefited and ultimately relieved by the judicious use of bacterins: Poll-evil, fistulous withers, quittors, accidental and surgical wounds. Although the foregoing diseases or diseased conditions are usually caused by the staphylococcus pyogenes aureus, albus and citreus and the streptococci, pyocyaneus bacilli are frequently present and occasionally the colon bacillus and other putrefactive organisms are factors of some moment.

Colt distemper or strangles is a condition caused by a streptococcus or at least a streptococci suppurative condition is the most important factor in the disease. Bacterin is a very valuable agent in its control.

Shipping fever, acclimation fever or stable fever is a variable disease usually manifested by catarrhal inflammation of the anterior respiratory tract. The etiologic factor of this disease has not been identified and it is doubtful if there is a specific infective microorganism, however, a streptococcus very similar to the streptococcus of colt distemper is usually present and is the usual cause of abscess formation in nearly every case of this disease in which abscess formation occurs. Thus bacterin is of value in the prevention and perhaps also in the cure of this disease.

In the use of bacterins one should recognize the fact that their therapeutic value depends upon the increase of opsonins by the animal body, i. e., increasing the animal's resistance. The increased resistance is of very great value in the healing of wounds because the length of time necessary for wound healing is diminished and the increased resistance so favors wound healing that the production of exuberant granulation is very rare and again the cicatrix or scar is invariably small. In cases of long continued suppuration the affected animal is usually unthrifty, has a rough coat and is usually emaciated, conditions which are usually corrected in some way, by the use of bacterin.

The value of the prevention of colt distemper or strangles and acclimation fever is self-evident and hence requires no discussion.

The rational application of bacterin in suppurative processes requires a careful observation of the patient as well as the proper preparation of the wound; in chronic processes, as fistulous withers and poll-evil, all necrotic tissue should be removed and free drainage provided; then the bacterin is given aseptically subcutaneously every four, five to seven days. (If a stock preparation is used the polyvalent bacterin is here indicated, because the condition may be caused from infection with staphylococcus pyogenes aureus, albus or citreus and streptococcus). Remember the bacterins will diminish the length of time necessary for wound healing, but if there is infection with some organism not used in the preparation of the bacterin, the condition may be unaffected by the use of the bacterin, if the bacterin is composed of the same kind of bacteria that are causing the suppuration, then there should be an increased production of pus beginning about twelve hours after injection of the bacterin and continuing for from twelve to twenty-four hours, and succeeding this the production of pus diminishes and it becomes thicker and still later the discharging pus may be admixed with blood, and finally cease entirely, and the wound heals without further disturbance.

In the treatment of recently inflicted wounds one should trim the wound and proceed in the same manner as though no bacterin was to be used, and then give an injection of polyvalent bacterin every three to five days. The bacterin increases the animal's resistance and thus diminishes the length of time necessary for wound-healing. Polyvalent bacterin injected every three to five days is particularly of value in suppurative puncture wounds, and open joints, infected with pyogenic bacteria. Many open-joint cases have been reported in which recovery was complete in a very short time.

Strepto-bacterin has been found very efficient in umbilical infection, omphal-ophlebitis and pyaemic arthritis in colts. In such cases two injections have usually been sufficient. One practitioner treated thirty cases of omphalo-phlebitis during 1910 with less than 10 percent fatality.

Strepto-bacterin has also been found to be of very great value in the prevention and treatment of colt distemper or strangles. For the purpose of prevention two doses given three to five days apart has proven quite

efficient. Of the animals so treated and reported by practitioners a positive immunity was obtained in about fifty percent of the cases, and the other fifty percent had a very mild attack. In the treatment of strangles the strepto-bacterin is used as an adjunct to the other treatment. If abscesses have formed they should be operated upon and the strepto-bacterin given every three to five days.

Acclimation fever is not specifically caused by any one infecting agent but Dr. Brown of Kansas City, has on a series of over fifty head of horses bought by one concern, produced sufficient resistance to this disease by the simultaneous injection of one dose of each of the polyvalent bacterin and the strepto-bacterin, repeating the dose on the third day, that only two or three of the horses ever missed a day's work from acclimation fever. Three or four of these horses were affected with the socalled pink eye variety of influenza, but this is apparently a different malady than acclimation fever. Other practitioners have been equally successful in the prevention of acclimation fever by the use of bacterins.

Colon bacillus bacterin combined with polyvalent bacterin, has been found to be very useful in many of the chronic cases of suppuration, as fistulous withers, that did not respond to the use of polyvalent bacterin alone. A bacterin composed of the B. choleræ suis has given some encouragement. Canine distemper and pneumo-bacterins have proved efficient in some instances, but they are only experimental.

Theoretically autogenous bacterins are superior to stock bacterins, but clinically stock bacterins have proven almost if not equal in efficiency. Cases that do not respond to the stock bacterins are usually relieved by the autogenous.

Fatty Degeneration of the Heart*

By C. A. NELSON, D. V. S., Brainerd, Minn.

This subject is thought to be one of the conditions not often referred to in veterinary practice; and because it is so rarely met with in practice, we are likely to overlook it, when it does occur.

The first consideration might be given to fatty infiltration, which may be physiological as the function of such tissues, are not destroyed, nor even changed to any great extent.

ETIOLOGY.—Heredity, especially in the case of swine, venesection, castration, and ovariectomy. Abundance of fat-forming food and insufficient exercise, are some of the common causes. All prime "butcher-stuff" are examples of fatty infiltration.

Fatty degeneration must be considered as a pathological condition, because the functions of the tissues involved are impaired and finally

*Read at Annual Meeting of the Minnesota State Veterinary Medical Association, St. Paul, January, 1911.

destroyed. The pathologist tells us, that it is a retrograde metamorphosis of the cell-contents and that the protoplasm disappears, being replaced by fat.

In general it may be said to be due to disturbances in cell metabolism.

Writers are not very definite on the causes bringing about this condition. Aside from pathological factors, such as febrile diseases, and lack of oxidation of the blood, we may assume that it is due to overbalanced rations, and lack of exercise.

One case of fatty degeneration of the heart and other internal organs, has come under my observation, and I believe it to be worthy of record.

The subject was a cream-colored gelding. The early history of this horse could not be learned, but it is assumed that he had been a "pet horse" up to about six years of age. He was one of a matched pair of creams with chestnut manes and tails, a rare color. They had evidently, during their early life, been pampered and continually kept in show condition, and had done but very little work.

At about seven years of age they were purchased by Mr. A. Purdy, a liveryman of Brainerd, Minn. He took excellent care of them, sugar being included in the diet. They were his "pet team," and a source of pride to him, as well as to the city of Brainerd.

In the early spring of 1910, the livery work increased, and there being a shortage of horses, consequently this horse was pressed into "country drives." It was after one of the first of these drives of about twenty miles, that the disease became manifest.

SYMPTOMS.—After being placed in his stall, it was noticed that the horse presented a very dejected appearance, and refused his feed. All the external surface was clammy cold; the pulse was nearly imperceptible; the respiration accelerated, and the temperature 106° F. He was a pitiful picture of extreme exhaustion.

DIAGNOSIS.—At first it was thought to be congestion of the lungs, but on auscultation it appeared that the air was passing in and out normally, besides there were no causes for it.

Nothing definite suggested itself, so the case was given up to study and symptomatic treatment. By the process of elimination, a tolerably certain diagnosis of fatty degeneration of the heart was made in a few hours.

TREATMENT.—This consisted of covering the horse with four or five woolen blankets, and the applications of cotton and roller bandages to the lower extremities. Liberal doses of brandy, fluid extracts of nux vomica, belladonna, and digitalis were given per orem. And glonoin was given hypodermatically every half hour, for four hours, later every hour.

COURSE.—After the fourth hour the skin began to warm up; respiration became easier and the patient appeared much brighter, drank some water, and began to eat a little hay.

In about fifteen hours he was, to all appearances, normal.

After three or four days' rest he did some city driving, doing very well, this created doubt as to the diagnosis. But from deduction it seemed that

it could be nothing else than a fatty heart, which was verified the next time he was driven into the country. The previous symptoms reappeared, the same line of treatment was adhered to. Recovery was not quite so prompt, yet he made an apparent recovery. This time he had a rest of about ten days, when he was again put to light work, short drives around the city. He performed his work fairly well for about five or six weeks, and the owner began to doubt the correctness of the diagnosis; however, the horse did not regain his former spirit, and without any exhausting drives, the final attack of the disease set in.

The symptoms were not so severe as far as the exhaustion was concerned, but persisted in spite of treatment for about ten days. In addition to the symptoms of the preceding attacks the bowels became torpid.

Aloes, magnesium sulphate, one pound a day, and later arecoline, had no appreciable effect. After the second day of this last illness, the temperature remained about normal. And in spite of the fact that the appetite was nil, he continued in good flesh. He died suddenly during collapse.

AUTOPSY.—An excessive formation of fat in all parts of the body, in the region of the flank and around the kidneys, there was a layer of yellow-colored fat measuring about three inches in thickness; similar to the leaf lard in a very fat hog. The heart, liver and kidneys were light in color, very friable, droplets of fat appeared on section. Later microscopical examination proved it to be fatty degeneration of all these organs.

SUMMARY.—*A*. The horse is subject to this disease.

B. Direct cause seems to be overabundance of fat-forming food, with insufficient exercise.

C. Symptoms are one or more attacks of extreme exhaustion, with a high temperature and a weak pulse. If an apparent recovery takes place it is very prompt.

D. Diagnosis can only be made by learning the history, by elimination, and the speedy recovery.

E. Course varies with the amount of tissues involved, and the usage of the animal. Death sudden, without struggling.

F. Prognosis, if the diagnosis is tolerably certain, must be unfavorable, although an animal may perform light work for some time.

G. Treatment should be symptomatic; no medication is likely to be followed by permanent recovery.

KOCH'S POSITION.—1. The tubercle bacilli of bovine tuberculosis are different from those of human tuberculosis. 2. Human beings may be infected by bovine tubercle bacilli, but serious disease from this cause occurs very rarely. 3. Preventive measures against tuberculosis should therefore be directed primarily against the propagation of the human tubercle bacilli.—*Herzog*.

Immunity*

By HERBERT F. PALMER, B. S., D. V. S., Chicago

Before the closing days of the seventeenth century, there was born in a small English town a man who was the first to demonstrate immunity. In 1770 a woman said in speaking of smallpox, "I cannot take that disease for I have had cow pox." But to Edward Jenner belonged the distinction of first proving it. In 1796 he inoculated the boy Phipps with matter taken from the hand of a girl who had been directly infected by a cow. In these earlier days cow pox was thought to be a disease due to infection from the heel of a horse affected with grease. Since that time comparatively little knowledge has been obtained of the old disease smallpox, but a great and forward movement has taken place regarding immunity.

While Jenner was the first to establish immunity, it remained for Pasteur in 1877 to give it a scientific demonstration. He observed that susceptible animals inoculated with cultures of the anthrax bacillus mixed with other bacteria did not acquire the disease.

The advancement made in the study of immunity really dates from the discovery of the germs of disease. While Aristotle had an inkling of the truth, bacteriology is a youth of scarcely more than thirty summers. The first step was proven when it was shown that minute forms of life, bacteria if you please, produced fermentation of various kinds and that these same small plants or animals were the chief agents in putrefaction. It is now known that bacteria are distributed throughout the animal and vegetable world. The saprophytes are essential to continuation of life, while the pathogenic or disease-producing bacteria are comparatively few.

There are three great classes of bacteria concerned in the question of immunity. One of these must needs grow within the living body, one is indifferent as to its host, growing and developing either within or outside the living body, and the third grows outside of the body in dead organic matter.

Today we are but really started in this great subject as there are doubtless many infectious diseases now but little understood, each of which is caused by an ultramicroscopic virus, a germ so small that even with our highest magnification it is impossible for us to get even a glimpse of them and they are known only by their works.

So many of the terms used to consider the question of immunity have been so twisted that their primary meaning has been lost sight of. In order to avoid confusion, we desire to define a few of these general terms.

A *toxin* is a poison secreted or elaborated by bacteria. A substance that counteracts or neutralizes this poison is an *antitoxin*. As an acid counteracts an alkali, so an antitoxin counteracts a toxin.

---

*Read at the Illinois Veterinary Medical Association, December, 1919.

A toxin depends on the germ for its development, hence if there is no germ there is no antitoxin—understand me clearly—there is no true antitoxin where germs cannot be isolated and grown. We may, however, use an antitoxin of one disease to counteract to a certain extent the toxin of another germ, as it has been found that any antitoxin possesses certain power over any bacterial poison. This fact is taken advantage of in the manufacture of a distemper antitoxin for the horse.

A *serum* is the liquid part of the blood taken from an animal. While it is generally spoken of as from an animal that has received such a course of injections or treatment that a specific serum is obtained as antidiphtheritic serum.

The word vaccine has been derived from the Latin word vacca (cow) on account of its early connection with cow pox. As now used, a vaccine is an agent containing living bacteria or a bacteria in an attenuated form.

A bacterin, although often spoken of as a serum of a vaccine, is neither, as it contains no living germs, but the dead germs. Note carefully the three classes. A serum should contain no germs; a vaccine is useless unless germs alive and attenuated are present; a bacterin contains the germs, but all should be dead. Vaccines are generally prepared outside the body while antitoxins can only be prepared in the living animal.

An opsonin is a substance contained in the blood which prepares bacteria to be taken up by phagocytes.

Immunity has been de ned as the power of an animal to resist the invasion of pathogenic bacteria. It may be peculiar to a species, to races or individuals and it may also be modified by special circumstances, as an animal normally susceptible to a certain disease will resist this same disease if environment is changed.

For example, Freidberger & Frohner state that the inoculation of horses, asses and white rats by blackleg produces only a local reaction in the form of a swelling. Herzog says blackleg affects cattle and occasionally other animals like sheep and hogs, while the Bureau of Animal Industry say that man, horses, hogs, cats and fowls appear to be immune. However I have seen donkeys inoculated and die with blackleg injections and cause of death clearly shown to be due to blackleg. Simply a case of changed conditions.

Several theories have been advanced as to manner of obtaining immunity, but we owe it to Metchnikoff, to make the first serious attempt to explain the resistance of the body against bacterial invasion.

Pasteur and Chanan considered the animal body a mere culture medium, while Metchnikoff formulated the conception of an active bodily defense originating in the cells.

Metchnikoff first propounded his theory in 1882—being within the memory of some who are before me today.

According to this theory the leucocytes attack and devour any invading organism which they may meet and thus rid the body of the parasites,

When they have enveloped and thus destroyed all the bacteria which have gained a footing in the body, the disease necessarily comes to an end. The defense of the animal economy is entrusted entirely to phagocytosis, and especially to leucocytes.

If a bacterium enters the tissues these cells may at once make their way to site of infection and endeavor to ingest the bacteria and kill them intracellularly. If the phagocytes are successful the animal recovers with or without transient illness.

There are three distinct stages of phagocytosis—approach of the phagocyte to the bacterium, inclusion and finally digestion or destruction. The leucocyte count thus becomes at times of prognostic value.

With the announcement in 1892 by von Behring of the discovery of antitoxins, arose the chemical theory of immunity.

The phagocytic theory of immunity is now accepted only as modified by the humoral theory by which it is claimed that certain substances in the fluids of the body constitute the important factor in opposing the invasion of bacteria. These substances have been given the name of alexins.

The opsonic theory recognizes phagocytosis as the essential means of defense, but considers the presence of the humoral element necessary to prepare bacteria for ingestion. Credit of the opsonic theory belongs essentially to Wright as in 1903, Wright and Douglas proved the presence in the normal serum of a humoral element which determines the occurrence of phagocytosis.

In still later days come to us the "Aggressin theory" of Bail in which he considers the aggressins are chiefly within the animal body and are supposed to act by negative chemotaxes upon the leucocytes and hence nontoxic. Immunity according to the aggressin theory depends on the formation by the body of "anti-aggressins" which once more permit the phagocytes to exercise their normal functions of defense. In concluding, Andrews says, "Whether or not the microbe forms chemical aggressins it at least exhibits structural adaptations which enable it to defy the defense of the body.

In viewing immunity from a chemical standpoint, Ehrlich evolved the Side Chain theory in which he assumes that a toxin has a side chain which can attach itself to a side chain of a cell. The name toxophore and haptophore was given to these groups, meaning I carry and I join. Repair is thus considered to go beyond the original supply and the cell thus becomes furnished with increasing number of side chains capable of fixing the particular toxin. So many side chains are formed that some are cast off into the lymph and ultimately get into the blood. This free side chain constitutes the antitoxin. The antitoxin thus lies in wait as it were for the disease to approach.

Upon this theory may be explained the many causes of failure with some of our antitoxins. A disease, as for instance tetanus, is present, and the system so laden with toxin that any amount of antitoxin we may introduce will prove insufficient. On the other hand if this antitoxin is

already placed in the system as a prophylactic, action is obtained at once upon the formation of any toxin and the cell thus wins out in the primary struggle.

Modern opinion has tended to swing back to the Metchnikoff theory, that of direct phagocytosis. Andrews says: "These are demonstrable biological facts which admit of no doubt or cavil. They are naturally interpreted as indicating the formation of chemical substances having the specific power of neutralizing the antigen, chemically or physically. How and where they are formed and how they interact with the antigen is still a matter of speculation."

The defensive agencies of the body on the whole are very adequate under normal conditions. While there are more or less bacteria ever present in our systems, the work of defense goes on without an obvious fuss or disturbance. But let this normal balance be broken, bacteria will begin to multiply and an infective disease will result. This will then result in a secondary call to arms and the great life and death struggle ensues. If bacteria win, death; if antibodies, life, and a life insurance policy against this same disease.

Says one writer in speaking of antibodies: "Not until antibodies and their antigens have been brought under the dominion of weights, measures and chemical formulæ, not until their chemical and physical properties have been ascertained by methods lying outside biology, shall we be able to feel sure that we are dealing with things and not phantoms."

In the words of Drs. Vaugn and Novy, "The question of immunity has long been, is and probably will long continue to be, one of the most perplexing problems which medical science has attempted to solve."

A Veterinary Clinic

Translated by Dr. E. M. Epstein, Chicago.

Case 1.—A mare, white spotted; sixteen years old; poor condition; became sick at night, February 8, without any appreciable cause. She pushed against the wall, staggered from behind forward and conversely and seemed every moment as if she would fall down. The pulse was small and irregular, the eyes wide open, the pupils dilated, the conjunctivæ injected, vision abolished, profound coma, no appetite.

Diagnosis.—Acute encephalitis.

Treatment.—In view of the animal's general condition and its age it was bled only about three pints. Revulsive frictions were given over the legs and trunk. I prescribed eighty granules (grain 1-67 each) of strychnine sulphate, and forty granules (grain 1-67 each) of hyoscyamine, five of each to be given together every fifteen minutes. A cold wet pack to the head; this was to be kept cold.

On the ninth the symptoms were not much more favorable, but the animal seemed to have more strength. A purgative bolus of aloes and croton oil was ordered, and sixty granules of the same as before during the day. On the eleventh the animal was sensibly better. She took food and did not push against the wall; her vision was reestablished. Eight days later the animal took up its work and was not sick again.

Case 2.—A bay horse, ten years old. This animal, after eating a great quantity of green lucern, traveled fifteen miles at a quick pace. On arriving at home the animal refused its oats and rolled on the floor of the stable. A veterinarian was called and he found the animal's abdomen swollen and sensitive to pressure; his head down, and conjunctivæ injected. He wanted to lie down and was covered with sweat.

Diagnosis.—Indigestion from overeating.

Treatment.—Five granules (grain 1-67) of hyoscyamine and five granules (grain 1-67) of quinine sulphate every ten minutes. Frictions with mustard water over abdomen and limbs. Purgative enemas and walking exercise. Forty granules each of hyoscyamine and strychnine sulphate were administered and recovery was complete.

Case 3.—A gelding, five years old, dull black color. This animal, after eating a great quantity of freshly-cut lucern, drank a big bucketful of water. After that he refused to eat his oats and rolled about in the stable. A veterinarian was called immediately and found the animal keeping its head down, the conjunctivæ injected, the abdomen tense and somewhat distended. The animal would contract the muscles of neck and shoulders, and throw up a great quantity of liquid.

Diagnosis.—Indigestion from cold water and overloading with food. The repeated vomiting caused the veterinarian to doubt the presence of stomach rupture.

Treatment.—Eight ounces of alcohol, and ten granules (grain 1-67) each of hyoscyamine and strychnine sulphate every ten minutes until eighty granules had been taken. Dry friction and purgative enemas. One hour after the ingestion of the granules the vomiting ceased, and half an hour after that the animal took its feed and its recovery was complete.

Case 4.—A bay gelding, five years old. This animal, like the preceding case, ate a great quantity of green lucern grass and was attacked with severe colic from indigestion. One hundred and ten granules (grain 1-67) each of hyoscyamine and strychnine sulphate was prescribed to be given five of each every fifteen minutes. The animal recovered promptly.

Case 5.—Cheese-colored cow, three years old. This animal was attempting to calve, but after much ineffectual straining lay down. Early the next morning she could not be made to get up by any means. A veterinarian was called and found a case of paraplegia with an almost complete insensibility of the loins. Rumination was suspended, and there was no appetite.

Treatment.—For the non-delivery ergot, two and one-half drams, and avenin, one ounce. Friction with oil of turpentine, repeated three times

a day. Two hundred granules (grain 1-67 each) of strychnine sulphate, five of which were to be given every quarter of an hour, also sixty granules (grain 1-67) each of aconitine and veratrine, of which five of each were to be given together with the granules of strychnine.

The next morning the animal was on her feet, ate two hampers of feed and began ruminating. The veterinarian ordered that she be given four ounces of sodium sulphate and injections of carbolic acid solution into the vagina. A week later the animal was perfectly well, although parturition had not yet occurred. A little while after this she calved without accident.

—*Repetoir Universal de Medicine Dosimetrique*, Vol. X, p. 573–576.

Aconitine: A Valuable Alkaloid*

By D. M. CAMPBELL, Chicago, Ill.

Aconitine is an alkaloid. It represents the full medicinal properties of the leaves and root, or tuber, of aconitum napellus.

Aconite belongs to the family, Ranunculaceæ. The plant, although poisonous, is widely grown for its beauty. It is a perennial, resembling the delphinium, or larkspur.

There are eighteen species of aconite, seven of which are found in the United States, chiefly in the northwestern part. Aconitum napellus is the variety recognized by the U. S. Pharmacopeia. It grows wild in the mountainous parts of Europe and Asia.

Besides aconitum napellus there are a Chinese aconite, a Japanese aconite, and an Indian aconite, all of which are largely used in medicine, and every one assays higher in aconitine than the official variety. In fact, the medicinal strength, or aconitine-content, of the plant and its medicinal preparations varies enormously, not only with the variety, but with the kind of land on which it is grown, the nature of season during which it develops, and the time at which it is harvested.

The tuber should be gathered at the time the plant flowers, which is never before the second and frequently not until the third year. Commercially, however, the tubers are gathered at various seasons of the year, pretty much whenever they can be found.

A good empirical test for the strength of the root is to chew a very small portion of it. If it gives at first a very bitter, acrid taste, followed in three or four minutes by numbness of the tongue and fauces, with a later sense of coolness when air is taken into the mouth, there can be little doubt that the substance is aconite and that it contains a reasonable amount of the active principle, aconitine.

Describing the physiological use of aconitine, Dr. John M. Shaller, an unimpeachable authority on the properties and uses of this drug, says:

*Read at the Missouri Valley Veterinary Meeting, Omaha, Nebr., July 12, 13, 1910.

"If a granule (gr. 1-134) is taken every half hour in health or when not indicated in disease, until four or five have been swallowed, a decided feeling of heat or burning is experienced in the epigastrium.

"There are also eructations in which the taste of aconite is recognized. If larger doses are taken or small doses are too frequently repeated, a feeling of warmth and tingling may be felt in the fingers and toes, then in the hands and feet, and finally in all parts of the body. This tingling or numbness is one of the first physiologic manifestations and may be preceded by heat in the epigastrium."

If we give to animals, whether a guinea-pig or a horse, a poisonous dose of the fluid extract or tincture of aconite, it occasions first a violent retching, which is followed, sooner or later, depending upon the size of the dose, by extreme weakness, which is succeeded by paralysis in the posterior extremities, and later a cessation of respiration due to paralysis of the respiratory mechanism. The heart continues to pulsate for some time after respiration has ceased. These toxic symptoms are preceded by the physiological symptoms described by Dr. Shaller.

Quoting from Dr. Shaller again we have:

"In the treatment of acute inflammatory diseases, aconitine rarely produces tingling or numbness. The presence of fever prevents this action. It is not necessary in order to reduce fever that tingling should be produced. Nor is it at all likely that tingling of the extremities will follow the administration of aconitine if it is given according to established rules. Whenever aconitine is prescribed to patients old enough to interpret sensations, they should be told that the medicine is likely to produce tingling of the lips, of the fingers and toes, and when this becomes manifest, they must reduce the dose or extend the time interval of taking the medicine. If this suggestion is acted upon there will be no danger of overdosing. Similar rules ought to be applied whenever any remedy of potency is given.

"It is our absolute duty to know the primary physiologic actions of every drug that we use, and whenever we give it, it is also our duty to inform the patient or the nurse to withdraw it when its physiologic effects become manifest. In this way harm is not likely to occur. Whenever you exceed the physiologic dose of any medicine, it then becomes a poison."

Of course, animals can not tell us whether they have tingling of the lips or toes or whether there is a feeling of warmth over the body, but in the horse the manifestation of the physiological action of aconite is so obvious that it can be described to any stockman, and he will be able to recognize it, and to lessen the dose of aconite or to lengthen the interval between doses when it is reached.

One of the earliest manifestations of the physiological action of aconitine in the horse is the slowing of the respiration. This is followed by a greater quiescence on the part of the animal. Soon there comes a softened pulse, about which time the hair lies down flat, to be followed in a short time by sweating in the flanks and behind the elbows.

In acute attacks of febrile diseases this sweating and sense of relief on the part of the horse are seldom produced by less than twelve hours' continual administration of aconitine. The average time is about sixteen hours. The minimum is four to eight hours.

This sweating is the symptom I always instruct the owner to watch for, and if he is administering aconitine every half hour, he is then to give it every hour, and later every two hours, and so on, just often enough to keep the animal comfortable, the hair just slightly moist in the locations named, and respiration free and easy.

In animals other than the horse the sweating is not produced by aconitine and the owner should be told to watch for other mainfestations of the physiologic action, or the veterinarian should give such a dose as he knows to be safe. In cattle the slow, deep respiration when the physiologic action is reached is sufficiently obvious to be noted by any intelligent attendant. In dogs a marked tendency to sleep is always present when the full physiologic effect of aconitine is reached.

Whenever aconitine or any other remedy is indicated and fails to produce the desired results in the dose given, it should be pushed until its first physiologic effects are presented. Until this is done a remedy has not been given a fair trial. The best way to insure physiologic effects is not by giving large doses at long intervals, but minimum doses at short intervals. The remedy should always be given in solution to insure rapid absorption.

If you dissolve one of the 1-134-grain granules of aconitine in your mouth it gives a very disagreeable sensation, which is persistent for several hours. Probably the same is true, though to a less extent, of the administration of aconitine to animals, but here we have little opportunity to avoid it.

Used hypodermically, aconitine induces severe itching and considerable pain at the point of injection; in some cases it may cause great discomfort to the animal. Therefore it should not be given hypodermically except in emergencies, and hence we have no choice but must administer aconitine tablets orally, usually in solution.

During acute attacks of febrile diseases, or at any other time, before the physiologic action is produced, aconitine should be given every half hour or at least every hour and never at longer intervals. After the physiologic action is established it may be maintained by less-frequent doses.

Quoting again from Dr. Shaller on this subject, we have:

"No danger can arise while treating fever with aconitine if it is gradually withdrawn when such prominent symptoms as pain, restlessness, delirium, flushed face, thirst, moaning, rapid pulse and quick breathing subside. Give the medicine frequently as long as these symptoms are marked. Then gradually reduce it as they abate and disappear. When tingling is produced it is simply a reminder that the system is fully under the influence of aconitine. No good can follow by pushing it further, and it is not necessary or wise to continue the medicine in as large doses or at

such short intervals. This is true not only of aconitine but of all other medicines that can produce physiologic effects. The aim should always be to give just so much of any drug as will relieve the symptoms for which it is given, and then lessen the dose when improvement is manifest or when primary physiologic effects are observed."

In animals, as in man, pain and fever produce a tolerance for aconitine, and an animal with a higher fever, bounding pulse, and severe pleuritic pain, will require a great deal more of this drug than will one with a milder attack, and very much more than a normal animal would be able to stand.

When aconitine is given, in exact and proper doses, to combat fevers, it cannot produce marked physiologic effects as long as this state, upon which the aconitine acts persists, because, the febrile conditions present utilize and require the full medicinal force of the remedy. If larger amounts are given than are required, or where the remedy is not at all indicated, the extra quantity, having nothing to combat, produces such physiologic or poisonous symptoms as may become manifest. This is true of all active medicines. Physiologic effects are more easily produced where there are no symptoms or conditions present to offer resistance to the action of the remedy.

An action similar to this has long been recognized as possessed by morphine. We know perfectly that poisoning by morphine can scarcely be produced where there is excruciating pain. The same is in a large measure true of aconitine. A sthenic fever is an exact antagonist of aconitine, and vice versa. Aconitine is a remedy *par excellence* for fever, and fever is an absolute indication for the administration of aconitine.

When aconitine is given in acute febrile diseases, the pulse and respiration are reduced in number. The blood-pressure is lowered through the action of the vasomotor nerves, which dilate the arterioles. The secretions are all augmented through action upon the secretory nerve-centers. The above effects are always produced by medicinal doses of aconitine when it reduces fever. This effect is brought about gradually and slowly and without any depression whatever.

Dr. Shaller, speaking of the use of aconitine to abort disease, says:

"Aconitine is the great jugulator of acute inflammatory diseases. Every endeavor should be made to administer it very early in acute inflammatory and in acute infectious diseases. The presence of fever, or of those premonitory symptoms which indicate that an acute febrile disease is threatening, is sufficient reason why aconitine should be administered. The presence of acute fever, even though it is impossible to foretell what the disease will be, is the only indication that is necessary for giving this remedy. In all cases in which asthenia is not present, active treatment with aconitine should always be begun at once.

"To give a placebo and wait until tomorrow, in order to make a positive diagnosis, before beginning active treatment, is a loss of very valuable time.

"The rise in temperature is ominous and may prove serious. When the body is plainly showing by many signs, as by abnormal temperature, chilliness or rigor, general lassitude, quickened pulse and respiration, that an inflammatory disease is threatening, experience cannot always say where the general storm, which seems to be gathering in all parts of the body or at least pervades throughout the body, will finally localize its entire force. If this force is localized, congestion results, and this in turn leads to inflammation. It is our duty to attempt to prevent this general storm from localizing in a single organ or structure. If the local congestion is primary and the general symptoms as described are secondary, our effort should still be for jugulation, and the results of treatment will be the same. Congestion may be checked and the disturbed circulation will be restored to the normal. Whenever this has been done an inflammation has been prevented. Even if inflammation is present it may be checked, preventing its further advancement and the establishment of disease."

Veterinarians do not, on the average, see conditions of this kind as early as does the doctor of human medicine; but when he has the opportunity to abort an acute febrile attack he should make every effort to do so, and failing in this, to follow up his attack upon the disease which has developed in spite of him, or before his coming, with unremitting, aggressiveness.

Dr. W. L. Williams of Cornell University, concerning this subject, says: "Clinically, however, we have ample evidence that those remedies which stimulate the excretory organs, tend constantly to alleviate the systemic effects of the infection." And, again, "It is a common clinical experience that the restoration of any or all of the excretory processes to the normal or hypernormal tends to reduce fever; consequently, from the earliest dawn of surgical practice resort has been made to those remedies which tend to stimulate these excretions in order to combat fever without specifying its cause."

Aconitine is preeminently the drug to assist in restoring the excretory functions during acute congestion accompanied by fever. It is a remedy *par excellence* to restore the equilibrium of the circulation and this is one of the first necessities for securing elimination, for neither the skin, kidneys, nor intestines can perform their excretory functions unless the toxins and waste are brought to them by the blood. If we have a large part of the blood of the body congested in one part, for example the lungs, there is a greater or less degree of anemia in all of the other excretory organs, and the functions of the lungs themselves are so impaired that excretion there is lowered.

It has been urged that the use of aconitine to combat a fever before we are able to diagnose the disease is not scientific. This objection should not hold. This much we have diagnosed: there is fever present, and aconitine is preeminently the remedy to combat it. There is a local congestion—a circulatory disequilibrium—a lack of "balance," and aconitine is of all drugs the one to restore normal conditions.

The fact that we are endeavoring to save the animal from the pain of the congestion and the injury of the high temperature will not in the least hinder our endeavor to give such other treatment—surgical or medicinal, as may be indicated. We are here discussing the uses of aconitine, and when we say that the patient with an acute inflammation requires aconitine, we do not mean to say that indications are not also presented for other medication. Cathartics may be required and in fact cathartics are required in nearly every case, and we cannot expect the full and prompt effect of the aconitine unless the cathartic is given, and such other indications as are present are met. It may be there is an abscess to drain, or a hernia to reduce; the administration of aconitine can in no way excuse failure to meet other conditions.

It may be asked, is there any febrilc condition in which the administration of aconitine is not required? To this we would answer, Yes. These conditions may be divided into three classes:

First, those ephemeral febrile conditions, and there are many of them, in which a recovery speedily follows without any medication whatsoever. The treatment of these is of course not necessary, but the administration of aconitine is advisable, nevertheless, because it is usually impossible to tell in the beginning whether or not the attack is going to prove serious. To wait until we can positively tell is to waste much valuable time, if it proves to be one of the serious cases. Since our interference with the inflammatory process will do no harm, even if it be one from which the patient will speedily recover without treatment, early treatment is to be urged in these cases in order to abort those that, indistinguishable at first from ephemeral variety, are of serious import.

Second, febrile conditions due to clearly patent and readily removable causes, such as result from the accumulation of feces in the intestines, the confinement of pus beneath the hoof, or lack of drainage in a wound. Here the administration of aconitine will do no harm and may even contribute to the comfort of the patient, but its use cannot be considered necessary. The important conditions to be met here are local ones and they are of such a nature as to be met by local treatment.

Third, febrile conditions that have run a severe course, are far along in the attack, and are markedly asthenic. Yet some of these may need aconitine and should by all means have it, though it is not of first importance and should not be used unless the other indications presented by the patient are also met and met *first*. The most prominent symptom here is the weakness or exhaustion, and it must receive first consideration. It should be combatted with strychnine and digitalin, strychnine for its stimulant action upon the nervous system, the sustenance of the vitality, and digitalin for the strength and tone it gives the heart. In conjunction with these, aconitine may be given to aid in the restoration of the equilibrium to the circulation, the balance which conduces to the excretion of waste products and toxins, and the conservation of the patient's strength.

A drug that very closely simulates the action of aconitine and one that might be substituted for aconitine in practically all of the foregoing indications is veratrine. It differs from aconitine chiefly in that its effect upon the circulation is less powerful than that of aconitine and it stimulates the emunctories more than does aconitine. Veratrine is to be preferred to aconitine in the asthenic fevers; aconitine to veratrine in the early stages of sthenic fevers. In many instances a combination of the two is advantageous.

FOR SALE—Veterinary practice, hospital with operating table, and auto. Two houses, one new. Property worth $4,500, price $5,000. Address No. 64, care of VETERINARY MEDICINE, 1926 Wilson Ave., Chicago.

POSITION WANTED—With a good veterinarian by a 1911 graduate. I have had experience in practice. Can begin April 16th. Address No. 65, care of VETERINARY MEDICINE.

FOR SALE—A country practice, hospital with equipment, and an eight-room house, located in Central Illinois, where the farmers own their farms; no renters. For particulars address No. 62, care of VETERINARY MEDICINE, 1926 Wilson Ave., Chicago.

FOR SALE—Veterinary hospital in Indiana, no competition, best thing in sight, a rare opportunity. Address No. 63, care of VETERINARY MEDICINE, 1926 Wilson Ave., Chicago, Ill.

FOR SALE—Operating table made by Frank S. Betz, Hammond, Ind. New in March, 1910. $60.00 cash. Address Dr. E. L. Krieger, 140 Elm St., Benton Harbor, Mich.

FOR SALE—Excellent location in thriving town, with a rich farming community and surrounding towns. No competition, nearest veterinarian 15 miles. Excellent reasons for selling. Address No. 66, care of VETERINARY MEDICINE, 1926 Wilson Ave., Chicago, Ill.

FOR SALE—A good practice in a Kansas town of 2,500. Only veterinarian in county. Best of reasons for selling. Will sell my complete outfit of instruments. For particulars address No. 68, care of VETERINARY MEDICINE, 1926 Wilson Ave., Chicago, Ill.

FOR SALE—An *American Typewriter*, good as new. Universal keyboard; eighty-four characters; will use a one or two-color ribbon. Price $12.50. Address 67, care of VETERINARY MEDICINE, 1926 Wilson Ave., Chicago, Ill.

CLASSICAL AIREDALES—Champion Endcliff Crack imported and Marshall Tinner imported at stud. Sixteen selected brood matrons. Gopher Airedales Kennels; largest kennels in the West. Send for valuable catalogue. R. M. Dodds, V. S., Mankato, Minn.

FOR SALE—A limited number of copies of "Surgical Diseases of the Dog," by Cecil French, D. V. S., $3.00 each. This is an excellent work on the subject; contains ninety-one illustrations and more than 400 pages. It formerly sold for $5.00, Address VETERINARY MEDICINE, 1926 Wilson Ave., Chicago, Ill.

A CARD LEDGER is the modern ledger; no closed accounts are ever in the way; no hunting for open accounts; no indexing of accounts. Every balance is shown at a glance. A complete record with the fewest written words. See the description in the advertising section.

FOR SALE—Town and country practice, with modern house and barn; established 7 years; no competition; good reason for selling. For particulars address 59, care of VETERINARY MEDICINE, 1926 Wilson Ave., Chicago.

FOR SALE—New edition of Henry's Feeds and Feeding. Just off the press. Tenth edition, entirely rewritten. Recognized authority on the subject. Price, $2.25, delivery prepaid. Address VETERINARY MEDICINE, 1926 Wilson Ave., Chicago, Ill.

WANTED—A position as assistant by a licensed veterinarian, five years' experience. Address 52 care of VETERINARY MEDICINE, 1926 Wilson Ave., Chicago, Ill.

FOR SALE.—Residence and hospital, with paying Iowa practice. Address No. 60, care VETERINARY MEDICINE, 1926 Wilson Ave., Chicago, Ill.

AMERICAN JOURNAL OF

Veterinary Medicine

SUCCESSOR TO

Missouri Valley Veterinary Bulletin

D. M. CAMPBELL, PUBLISHER

A MONTHLY JOURNAL OF COMPARATIVE MEDICINE, DEVOTED TO THE INTERESTS OF THE VETERINARY PROFESSION

Per Annum in Advance..... $1.00
Single Copy..... .10

ADVERTISING RATES

IN EFFECT JULY 1, 1910

1 Page, per year	$150 00
1/2 Page, per year	90.00
1/4 Page, per year	50 00
1/8 Page, per year	30.00

WANT ADS and **FOR SALE ADS** $1.00 per issue for 25 words (exclusive of the address), or less, invariably cash in advance. Three insertions for the price of two.

All bills for advertising will be collected by sight draft after due notice.

Original articles, case reports, and veterinary news solicited for publication. Articles for publication must be short and practical.

The editor is responsible for his own opinions only. He says what he believes to be the truth and will be grateful to readers if they will take the trouble to point out his errors to him.

ADDRESS

D. M. CAMPBELL,
1926 WILSON AVE., CHICAGO, ILLINOIS.

Army Legislation

On a number of occasions recently we have urged the readers of VETERINARY MEDICINE to actively support the bill now before Congress calculated to improve the efficiency of the Army veterinary service and render more desirable the post of veterinarian in the Army.

The Senate Army appropriation bill granting retirement to Army veterinarians and having some other features favorable to the veterinarians in military service passed the Senate February seventh and is now before a conference committee of the House and Senate.

This bill is a step in advance so far as the veterinarians in the Army are concerned and deserves the support of all patriotic veterinarians.

Write at once, for it must acted upon soon, to your representative, urging him to support the senate measure and you may be instrumental in securing the enactment of this badly needed legislation.

Renewals

More than seven hundred renewals are due this month and we believe we will receive all of them. We certainly want to receive them all. If your subscription expires with this issue it will be so marked on the wrapper.

Let us have your remittance by return mail. You have the dollar, we know, and *intend* to send it in. It is no more trouble one time than another and it will help us out a lot if it is received before the stencil of your name and address is destroyed.

Our April issue is going to be a hummer—without any exception the best veterinary magazine ever published. You will want it. There is just one sure way to get it. Keep your name on our list now that we have your correct address.

Swamp Fever

Those in attendance at the annual meeting of the North Dakota Veterinary Association last month were given a treat in the report of Dr. L. Van Es of his investigations into the cause and symptoms of swamp fever.

Dr. Van Es has for the past four years devoted much time and study to this disease. His patient investigations have been rewarded by the discovery of many important facts concerning this little known but wide-spread ailment of horses. Among his more important discoveries are:

1. The contagion is eliminated from infected animals solely by the urine and is transmitted naturally by urine contamination of the food or drink.

2. The disease manifests itself in two forms, acute and chronic. The former is the commoner of the two and is very seldom diagnosed as swamp fever. In this type there is no anemia, hence the disease is more common than is generally supposed and the name anemia, as applied to it, is ill-chosen.

3. Many apparently healthy horses are carriers of this disease and serve to infect others with which they are kept.

Unfortunately the Doctor's address was not written, but the following notes made from memory will indicate its interest and importance. The complete record of the investigation is in the hands of the printer and will be published soon as a Bulletin of the North Dakota Experiment Station.

"Swamp fever is an infective disease readily transmissible from horse to horse. We have so transmitted it to the sixth generation.

"This disease is wide-spread occurring in many places in the United States and Canada, and without doubt it is identical with a disease with which veterinarians in France and Luxemburg are struggling at the present time. In fact it is wide-spread all over the world.

"The infective agent is an ultra-microscopic filtrable virus transmissible by the blood and urine either intravenously, subcutaneously or orally.

"The natural infection is in all probability solely by contamination of the feed or water by the urine of affected horses.

"Swamp fever is not necessarily an anemia; in fact in the majority of deaths from it, there is no anemia present and the blood count is frequently

above normal, sometines running as high as 13,000,000. Most animals dying from swamp fever die from an acute or sub-acute septicemia. In the chronic cases there may be a very marked anemia, but this is not always the case. In one case of swamp fever that has been constantly under observation for a period of two and one-half years the blood count has never run below 8,000,000; yet the blood and urine of this animal has been constantly virulent during this whole period.

"The greatest problem connected with this disease is the problem of diagnosis. At present there is no positive means of diagnosing it except by the inoculation of a susceptible animal. The anemia and the good appetite and failing condition are not diagnostic, as has been pointed out, except in the chronic cases, and are not infallible there.

"Cases which apparently recover are usually carriers of the infection.

"During the first sixty days after infection there is usually six or seven exacerbations of the disease accompanied by general malaise and an abrupt rise in the temperature to 105° F. or 106° F., and by various other symptoms. If the animal survives these initial attacks the disease runs a chronic course varying in duration from three or four months to as many years or longer, during which exacerbations will be manifested at quite regular intervals. These intervals may be as long as sixty days. Between the exacerbations the animal may be apparently normal. This fact has an important bearing on the many cures that have been reported.

"Albuminuria is invariably but irregularly present. Its appearance is usually synchronous with the rise in temperature. Albuminuria is rare in horses under other conditions.

"There are no lesions severe enough to occasion death and none are constant. The following are usually present:

"The heart shows an insufficiency which is particularly noticeable near the end. On autopsy it has a parboiled appearance or the appearance of brown atrophy. Sub-endocardial hemorrhages are common.

"There is frequently a lymph node involvement, the glands being enlarged, anemic or edematous.

"Bone marrow: Not much is known of the bone marrow of the horse either in health or disease, but the following observations have been made in autopsies of swamp-fever cases and they are fairly constant:

"The lesions are most constant in the femur, where the red marrow is replaced by red or fetal marrow and fatty material is found in place of the marrow cells in the cancellated tissue.

"The appearance of cases of swamp fever on a farm from time to time indicate that there is a carrier on the farm. To find this carrier is often a most difficult task. Innoculation trials on other horses are not practical. The best means we have at present is to keep a temperature record of every horse on the farm for a long period—at least three months. You will agree this is almost impracticable.

"In the treatment of swamp fever no drug has proven of any value. Pretty much everything in the materia medica and a great many things that

are not there have been tried by the general practitioners with unsatisfactory results. We have tried arsenic, quinine and gold and a great many other agents and all have failed absolutely. We have also tried atoxyl and the newer remedies suggested by Prof. Ehrlich in his chemo-therapy studies, with the same result. A serum, that for a time was very promising, failed in the final test.

"In the way of prophylaxis we recommend that animals known to be infected be destroyed or at least isolated in barms or pastures where they cannot contaminate the feed or water of other horses.

"The non-clinical carriers should be located and isolated or destroyed.

"Assume the disease is transmitted by urine contamination of the feed or water and stable contamination either by the urine direct or by dust and take every possible precaution to prevent it. Particularly safeguard the drinking water where the well is located within the barn as is the custom in North Dakota.

"Some horses are naturally immune to swamp fever."

Chronic Bacterial Dysentery

A number of readers have called our attention to and doubtless many others have noticed the error in the December issue where "Johne's Disease" is referred to as "chronic protozoan dysentery."

We plead guilty to allowing this error to occur. In the vernacular we were caught "with the goods on us" and have to "own up." Our only excuse is a lame one but we here give it. The reproduction of this bulletin was ordered while absent from the office and without our having read it.

Dr. John R. Mohler, Chief of the Division of Pathology of the Bureau of Animal Industry, replying to an inquiry concerning this subject, says:

"The characteristic protozoan dysentery of cattle has not to my knowledge been observed in this country, while chronic bacterial dysentery (Johne's disease) has been found to exist in many of the states.

"Chronic bacterial dysentery is caused by an acid-fast organism which was first described by Johne and Frothingham in 1895, and since that time the disease and the infective agent has been studied by a great number of investigators. Pearson was first to identify the disease in this country. Until the present time the artificial cultivation of the organism has not been successful. The disease is always manifested by a chronic course and a persistent diarrhea, which in the onset of the disease may be intermittent; later, however, it becomes continuous. In rare cases the diarrhea may be absent, yet the animals will manifest marked emaciation and anemia. The disease usually extends over periods of months, even up to two years. The postmortem lesions are characteristic. Sections of the mucous membranes of the small and large intestines show a marked thickening and corrugation, the surface being smooth and pale. Occasionally the corrugated mucous membrane shows congested areas, or even it may be

sprinkled with small hemorrhages. The mesenteric lymph glands and the Peyer's patches show moderate swelling. Microscopic examination of the thickened mucous membranes shows a marked diffused cellular infiltration, and particularly so around the papillæ which also may show desquamation of epithelia. In these parts the specific acid-fast organism is present in smaller or larger clumps, and in a similar arrangement it is found in the corresponding mesenteric lymph glands.

"The infectious nature of the disease was first proven by Bang, when he succeeded in transmitting it to two calves by feeding them with the scrapings of the mucous membrane of the intestines from an affected cow.

"Up to the present time no satisfactory treatment has been found for this disease, and prevention by isolating the affected animals appears to be the most rational way of combating the disease.

"Coccidial dysentery of cattle occurs almost invariably as a hemorrhagic dysentery and in practically all cases as an acute affection. It is caused by the Coccidium oviforme, and was first recognized and studied by Zschokke of Switzerland, where the disease is particularly prevalent. The anatomical changes and symptoms of this disease differ greatly from those of chronic bacterial dysentery, running an acute course—usually from five to ten days. The lesions are confined to the large intestine which shows extensive hemorrhage, and the contents are also intermixed with blood. In passing the bloody feces the animal strains considerably, which frequently causes a prolapse of the rectum."

This places the matter in a clear light and we shall endeavor not to let a similar error slip through again.

Fundamentals of Live Stock Sanitary Legislation

It is apparent to all who have given the matter consideration, that in many states the law creating Live Stock Sanitary Boards and the regulation of Live Stock Sanitary matters are inefficient and unsatisfactory.

The United States Live Stock Sanitary Association took up this matter at their sixteenth annual meeting in Chicago, December 5, 6 and 7, and appointed a committee to investigate and report upon the matter. This committee made no attempt to formulate a model law that would be acceptable to the various states but wisely confined their efforts to an attempt to agree upon the necessary general requirements or fundamentals.

Dr. M. H. Reynolds of Minnesota was chairman of the committee, which, recognizing the superior features of the Minnesota Live Stock Sanitary Regulations adopted them as fundamentals for such purposes.

The live stock sanitary laws of Minnesota are largely the creation of Dr. Reynolds and he takes a pardonable pride in their excellent working. Their reasonableness is shown by the fact that the fundamentals as recommended by the committee were adopted by the Association without an amendment or a dissenting vote although there were more than thirty-five live stock sanitary organizations represented at the meeting.

The statement of the fundamentals of good live stock sanitary legislation is as follows:

1. Legal provisions should be made that the executive officer must be a veterinarian.

2. The executive officer should be appointed by a small nonpartisan board.

3. Said board should consist of stockmen and veterinarians.

4. Final authority for general policies and general methods should rest with the board.

5. Election, term of service, and pay of executive officer and other appointees engaged in State live stock sanitary control work should be in the hands of the board.

6. Board members should do no field work in person and should receive no pay other than actual expense incurred in attending necessary board meetings.

7. The board should be invested with authority to suitably dispose of animals affected or exposed to communicable disease.

8. The board should be authorized to issue necessary operative quarantine regulations.

9. The executive officer and deputies should be invested with necessary power so that they may enter premises, inspect, quarantine, and enforce disinfection.

10. The law should provide penalties for violation of law or regulation.

11. The law should provide that anybody who knows of or suspects the existence of any communicable disease, must report to the State under penalty.

NOTE.—Members of this Association are asked to secure for this circular the widest distribution possible, especially in states where a revision of existing regulations or new legislation is contemplated.

For additional copies address the Secretary.

J. J. FERGUSON, *Secretary.*

Union Stock Yards, Chicago, Ill.

Chemo-Therapy

For a number of years the advocates of serum-therapy have had their inning. Dividing popularity in medical lines only with the surgeon. But very recently chemo-therapy has been commanding greater attention in medical circles than formerly.

The most noted example of this newer therapy is the now famous "606" of Ehrlich. This compound has received so much attention from the medical press and in the general magazines that most veterinarians no doubt know of it. Briefly it is an arsenic compound and is so called because it represents Prof. Ehrlich's 606th attempt to produce such a compound that would cure syphilis. This product is used in one large

single dose and it is claimed that in selected cases of syphilis it will effect a cure in four days. The chemical actually destroying the germ of the disease throughout the body.

Elsewhere in this issue is given a report of the cure of tuberculosis by the intravenous injection of a 1 to 1,000 solution of chinosol. This chemical, the user claims, destroys the tubercle bacilli throughout the body or so inhibits its development that the body forces are able to overcome it.

Benetol, an antiseptic recently placed on the market, has claimed for it the property of inhibiting the growth of organisms in the animal body without injury to the living animal.

In veterinary medicine certain combinations of the nature of "606" are, it is said, now being tried in the treatment of certain of the protozoan diseases indigenous to Central Africa.

Abstracts from Recent Publications of Interest to Veterinarians

From THE EXPERIMENT STATION RECORD

Gnathostomum spinigerum in a domestic cat. S. N. Mitter (*Jour. Trop. Vet. Sci.*, 5 (1910), No. 2, pp. 284-285, pl. 1).—This parasite previously found in the stomach of several wild animals of the cat tribe, is reported to have been found in the domestic cat for the first time.

A Disease Simulating Paresis of Pregnancy. S. Laufer (Allatorvosi Lapok, 31 (1908), No. 43, pp. 526-527; abs. in Berlin, *Tierarztl. Wochenschr.*, 26 (1910), No. 22, p. 444).—A description is given of a disease which simulates the paresis of pregnancy and occurs in pregnant animals which indulge in too much food and too little exercise before parturition. The treatment which was applied with good success consisted of injecting air into the mammary gland with Ewar's air pump. Recovery was obtained in from one to two hours. The parturition was normal.

The Agglutination Test in Glanders. Nevermann (Berlin. *Tierarztl. Wochenschr.*, 25 (1909), No. 19, pp. 347-350).—Results of agglutination-tests carried out from April 1, 1907, to March 31, 1910, in Prussia, with 1,750 horses, are reported. Of this number 283 were either killed or died, of which 177 on autopsy were found to be glandered, and 69 were killed for other causes than glanders and not on the basis of the agglutination-test. From the work the author concludes that the agglutination-test is an excellent aid for the early diagnosis of glanders, but further that the findings with reference to the agglutination figure can only be compared when the tests are conducted by the same method and with the same standard solution, or those of equal strength.

Von Behring's Protective Vaccination of Bovines Against Tuberculosis, its theoretical foundation and its practical utility. J. Nowak (*Zischr. Infektionskrank, u. Hyg. Haustiere*, 6 (1909), Nos. 5, pp. 313-347;

6, pp. 409-445). The results of vaccinating 202 calves (at four barns containing from fifty to eighty head of full-grown cattle each, and which reacted more or less to tuberculin) with von Behring's Bovovaccin are given. The author concludes that at present no practical value can be attributed to vaccination, particularly as regards preventing the spread of tuberculosis among bovines, but on the other hand it seems to have no detrimental effect on the health of the vaccinated animal. The theory of the method is considered correct.

Utilizing the Complement Binding and the Agglutination Reaction for Foretelling Abortion in Cows. H. Holth (*Berlin Tierarztl. Wochenschr.*, 25 (1909), No. 37, pp. 686-687).—The author utilized for this purpose the abortion bacillus (originally described by Bang and Stribolt), which was isolated from uterine exudates in cases of abortion (horse-serum from a healthy horse inactivated at 143.6° F. for one hour). Bouillon-cultures of the bacterium were injected intravenously into a small horse in increasing doses until 100 Cc. were given. Agglutination-tests carried out with the resulting serums against various strains of the abortion bacillus showed them to be definitely positive in dilutions up to 1 : 10,000. The serum was finally tested against the serum of cows in ten barns where abortion was prevalent. Thirty-eight serum-tests (dilutions 1 : 100) were positive, giving definite reactions. The complement binding reaction was positive in seven instances with the blood serum of the animals.

Contributions to the Pathology and Treatment of Milk-Fever. Bredo (Abs. in *Berlin. Tierarztl. Wochenschr.*, 26 (1910), No. 21, pp. 430-431).—Calving- or milk-fever, according to the author, is a "hypo-seroamia," that is, it is a general, acute, progressive anemia, with a diminution of the blood serum which is dependent upon the dehydration of the blood, and which finally results in physiological congestion of the mammary gland when milk-secretion begins.

For the preventive treatment the author recommends giving the animal as much water as it desires directly after parturition and not to milk before twenty-four hours after the birth. In the event that the animal will not take water, thirst should be stimulated with either salt, bicarbonate of soda, or similar substances. If the disease has already set in, the classical treatment, that is, inflation of the udder with air, should be given, together with intrauterine, intrarectal and subcutaneous injections.

The Bacteriology of Commercially Pasteurized and Raw Milk

Bulletin 126 on this subject, just issued by the Bureau of Animal Industry, is one of the most important of the year.

So bitter has become the conflict between the supporters of pasteurized and unpasteurized milk that the chief aim of both sides, the improvement of the market milk, was in danger of being lost sight of.

This bulletin, which is written by S. Henry Ayres, bacteriologist, and William T. Johnson, scientific assistant in the Dairy Division of the Bureau of Animal Industry, is an official and painstaking recognition of both the merits and the disadvantages of pasteurization.

The argument and conclusions on the subject are supplemented by a vast amount of statistical information bearing upon the result of pasteurization upon market milk.

The contents of this bulletin are of such great importance to veterinarians that any summary of it is out of place here since veterinarians should at once procure the publication for himself.

Negri and Lentz's Bodies and Changes in the Nerve Centers in Rabies

L. D'Amato and V. Faggella (*Ztschr. Hyg. u. Infektionskrank.*, 65 (1910), No. 3, pp. 353-368, pls. 2.)

The authors were not able to verify Babes's views (E. S. R., 19, p. 382) in regard to the relation of the black granulations found in the nerve centers to the Negri bodies. These peculiar granulations were seldom found in brain areas where the rabic virus was most concentrated, which is against the hypothesis that these bodies represent the innermost granules of the rabies parasite. The authors were also able to observe experimentally that some of the Negri bodies never contained these bodies. Negri bodies which were transplanted on the brain cortex of rabbits were found to become necrotic and then disappear while the rabic virus, on the other hand, was capable of exciting some toxic action on the areas vaccinated. This is contrary to a theory of the parasitic nature of the disease. Lentz's bodies are to be considered, according to the authors, involution bodies of the cell.—*Experiment Station Record.*

The Influence of Nutrition Upon the Animal Form

By H. J. WATERS

(*Proc. Soc. Prom. Agr. Sci.*, 30 (1909), pp. 70-98; Separate, pp. 29, figs. 6.)

This is a preliminary report on the study of the effect of limiting the quantity of feed upon the size, form, and development of immature, unsexed, high-bred beef cattle which were mostly crosses between Shorthorns and Herefords.

In the first experiment reported the calves were fed until about six months of age all they would eat of whole milk, mixed grain, and alfalfa. The data reported covered a feeding period which continued on the average for about nine months to thirty months of age. The character of the feed was the same for all animals, but the amount was varied to secure the different ratios of increase in live weight required.

For each centimeter of increase in width of hip, made by the full-fed group, the increase was 1.48 cm. in height at the withers, whereas in the case of the groups so fed as to gain only one-half pound in live weight per day, there was an increase of 2.31 cm. in height for each centimeter increase in width of hip. In the maintenance animals the ratio of gain in width to height was 1:3.11. The ratios of increase in width of hip, increase in length of foreleg, and in width of chest to length of leg also showed that the height growth of poorly fed animals was relatively much more rapid than the width growth.

Measurements were also made on young growing animals, beginning in some instances at birth and continuing up to from eight to fourteen months. The results gave further evidence that a decreased supply of nourishment manifested itself more quickly in width than in height development. Histological examination showed that there was but little difference between the diameter of the muscle fibers from animals in average farm condition and those in a highly fatted or show condition, but that when an animal was held for a long period of time on a very low nutritive plane the diameter of the muscle fibre was much reduced. The increase in the thickness of the flesh covering and the difference in the outline or form of the body of an animal that has been fattened, or changed from an ordinary farm condition to a market or show condition, was due chiefly to the increase in the number and volume of the fat cells rather than to increased size of muscle fiber. The diameter of the fat cells was found to range from twenty microns in animals on a low nutritive plane to 250 microns in animals in high show condition.

—*Experiment Station Record.*

Minnesota Meeting

The Minnesota State Veterinary Medical Association outdid all other State associations this winter in the duration of its meeting. The inimitable secretary, Dr. G. E. Leech, had scheduled a four-days' program, and it goes without saying that it was carried out as planned.

Special features of the meeting were the discussion of bacterins, led by a paper by Dr. A. T. Kinsley, of Kansas City, which occupied the entire session of the evening of the second day, and the lecture and demonstration on the neurectomies of veterinary practice, by Dr. L. A. Merillat, of Chicago, which occupied the whole of the fourth and last day of the meeting.

The attendance at this meeting was fair, but not what it should have been, considering the excellence of the program. The interest in the program was at all times good.

Dr. C. A. Mack of Stillwater was elected president for 1911 and despite his protests Dr. Leech was reelected secretary. The Association will hold a midsummer meeting in July.

Iowa Meeting

The twenty-third annual meeting of the Iowa Veterinary Medical Association was held at Marshalltown, January 3, 4 and 5, and even the inclemency of the weather, which was the worst of the winter, could not keep the veterinarians away. The attendance was good, nearly 100 being present during the meeting.

The entire program, as published, was rendered, and in addition, a whole lot of politics not in the program was discussed. The impending changes in the regulations governing the inspection of stock in inter-state traffic, and the fact that a state veterinarian is to be appointed next April, gave those in attendance plenty to think of in the political line. There are six applicants for the position of state veterinarian.

The Association decided to hold its next meeting in November of 1911, when it is hoped the weather will be more propitious than in January.

Dr. Hal C. Simpson, secretary for the past eight years, was elected president, and Dr. C. H. Stange of Ames, secretary.

North Dakota Meeting

Visitors to the sixth annual meeting of the North Dakota Veterinary Medical Association received many pleasant surprises. Of course, being so well up in the region that wasn't discovered by Dr. Cook, cold weather was to be expected, and Fargo proved no disappointment in this particular.

The State Agricultural College of North Dakota is located at Fargo, and in the Veterinary Building of this school a part of the meeting was held. Too much can not be said in praise of this veterinary building. It is not large, but is ample for the needs of the veterinary department. In laboratory and hospital equipment it is unexcelled in quality. Dr. Van Es purchased the equipment for this building during his sojourn in Europe the summer of 1909, and the usefulness and convenience of every part demonstrates that he had clearly in mind exactly what was wanted. The stalls in the hospitals not only have concrete floors, but have reinforced concrete partitions, walls and ceilings. This is a building that will last forever, and can readily be disinfected. The amphitheater and dissecting room, like the laboratories, are models of convenience.

It may not be generally known, but the North Dakota Agricultural College has outlined a four-year strictly veterinary course. The entrance requirements for this course are high-school graduation. But two years of the course are given at present, but it is expected to prepare for the other two years soon. Drs. Van Es, Schalk and Harris constitute the faculty.

The leading feature of the meeting was the talk given the Association by Dr. Van Es on swamp fever. We are giving an abstract of this address elsewhere in this issue, and take this opportunity to urge all to read it.

A banquet at the Gardener Hotel was enjoyed by every veterinarian present at the meeting. The second day of the meeting was devoted to

surgical topics. Dr. L. A. Merillat, of Chicago, led off with a three-hour lecture on surgical operations met with in veterinary practice, and in the afternoon demonstrated in the clinic room the operations he had discussed.

Wisconsin Meeting

The attendance was very large at the meeting held the 11th and 12th of January.

An attempt was made to expel a prominent member of the association. He secured an injunction delaying the action for thirty days and as a consequence a considerable number of those present withdrew from the state association and formed a new association.

A state veterinarian is to be appointed soon in Wisconsin and this, together with the excitement mentioned above, served to keep time from dragging during the meeting.

The Treatment of Pulmonary Tuberculosis by Intravenous Injections of Chinosol with Formaldehyde

By JOHN McELROY, L. R. C. P., and S. Edin., L. F. P. S., Glasg.

Case 1.—The patient, a man aged 54 years, had been ailing for about twelve months with a history of hemoptysis, pleurisy, cough, and profuse expectoration, and of having lost a considerable amount of weight. Acting on the advice of his medical attendants he spent four months at a sanatorium, and, although he put on 21 pounds in weight, when he left he was in a very weak condition, and the cough and expectoration had decreased very little. He tried as well as possible when at home to keep up his sanatorium methods, and for five weeks held his own as far as his weight was concerned, but was not getting any stronger. He then began to lose weight, and for the three weeks before coming under my care lost one pound, one and one-half pounds, and two and one-half pounds respectively. Under the intravenous injection of chinosol and formaldehyde he recovered his weight, rapidly regained strength, and at the end of four weeks' treatment was able to walk—without unduly distressing himself—two or three miles at a time. His chest condition before treatment showed symptoms of a cavity at the apex of the right lung, with signs of involvement of the middle and lower lobes. After treatment all adventitious sounds had disappeared, and the only appreciable deficiency was at the apex, where the expansion was not what it ought to be, this naturally being due to the contraction brought about by the healing process. Dr. J. A. Sinton of the Queen's University, Belfast, examined the sputum for me before, during, and after treatment, and reported as follows:

Before treatment: Oct. 23, 1909: Tubercle bacilli very numerous and averaging about fifteen per field.

During treatment: Nov. 1: Tubercle bacilli less numerous. Nov. 23: Tubercle bacilli scanty. Dec. 13: Tubercle bacilli very scanty and

nearly all of the granular type, and averaging about one per field.

Since treatment: Feb. 21, 1910: Tubercle bacilli absent. April 18: Tubercle bacilli absent.

From Dec. 13, 1909, onwards I was unable to get a specimen of sputum, but on Feb. 21, 1910, the patient was working all day in the rain and dried his wet clothes on himself. He then took an acute attack of bronchitis, and at this time I had his sputum examined, when Dr. Sinton, after a most exhaustive examination, was unable to detect any tubercle bacilli. I was able to get a small specimen again on April 18, and Dr. Sinton notified me that he was still unable to detect any bacilli. At the present time (Nov. 5) the patient is as well as possible and is working as hard as ever he did in all kinds of weather. He cycles to and from his business, distant over two miles, and all uphill the one way. Expectoration is completely absent. The patient is an engineer, commences his work at 6 a. m., and is often working all night.

Since treating the foregoing case I have had two more cases under my care, brief details of which I will now give.

Case 2.—In this case expectoration has been reduced to less than one-half, the weight has increased to normal, and the patient's strength has improved vastly. The sputum at the present date shows a reduction in tubercle bacilli from 20 to 12 per field, and the granular type is now predominant. This patient at first only got half the number of injections I considered he would require, as he developed a phlebitis in his veins and I had to stop treatment. He is again receiving injections, but unfortunately I have a great deal of difficulty in administering them, as his veins seem to be very easily irritated. He has, however, not lost ground. His chest condition is much better and the negative lung pressure is almost doubled.

Case 3.—This patient is still under observation, but I have stopped treatment, and he has been working at his trade—that of a ship carpenter—for the last five weeks. The night sweats stopped after about ten injections and his temperature became normal, fluctuating occasionally until Sept. 13, when it became normal, and has since continued to do so. I administered the first injection upon July 6, and between that date and Sept. 18 administered 36 injections in all. On Oct. 3 he resumed work, and at the present date he is working hard from 6 a. m. till 5:30 p. m. in all kinds of weather without experiencing any ill results. He can walk five miles in one and a quarter hours without undue fatigue. All râles and crepitations have disappeared from the chest, medium râles being very pronounced back and front in right lung and fine crepitations in upper portion of left lung before treatment. Expectoration is almost absent, the tubercle bacilli being reduced from 40 to 8 per field, the bigger number in this case also being granular. At the same rate of decrease I hope to see it negative in about another two months.—*The Lancet*, Vol. CLXXIX, London, Nov. 12, 1910, p. 1408-9.

Opinions on Many Topics by Readers of

"Veterinary Medicine"

Information Wanted

1. What is a levator humeri abscess? Give treatment.

2. Is it advisable to inject solutions, etc., into open joints?

3. What is the most effective treatment for oxyuris, inhabiting the rectum of the horse?

4. What is the present status of antitoxin treatment for canine distemper?

5. Which is the more preferable, dry or moist dressings for the treatment of wounds and ulcers?

6. Give the therapeutic actions and indications for citrate of potassium?

7. What is the best method or contrivance to correct tongue lolling?

8. Should Mallein be relied upon as diagnosis for glanders?

9. Is profuse diuresis constant after using, intravenously, normal-salt solution?

10. Is there any clinical difference between swine plague and hog cholera?

11. Did you ever know of a mare mule having a colt?

12. Give symptoms and treatment of hip-joint lameness?

13. What is the difference between autointoxication and intoxication?

14. How would you advise a client, who told you he had a six-month-old colt, with a small umbilical hernia, that was just as large but no larger now than at time of birth?

15. In using quinine and urea hydrochloride in diagnosing lameness what percentage solutions should be used? R. L. C.

Wanted—A Diagnosis

A big bay gelding weighing 1,800 pounds; used for farm work; stands in the stable with its head down to the ground and inclined to the left. The left forefoot advanced forward, but no weight on it. Occasionally he tries to double up as though he had cramps in the bowels. He has been in this condition two weeks. At first, these spells came on him every three or four days, but now they are coming twice a day.

He will take them in the harness, but if urged on will not be as severe as in the barn where he is free from harness.

His appetite is good and cleans up all feed given him.

The last two days he has been going a little stiff or lame on left foreleg. After he comes out of one of these spells the bowels move freely; he will also snort as if he was scared.

What is it? What is the cause of it and what treatment should be given? W. O. LONGFELLOW.

Carey, O.

Who Has the Answers?

A subscriber sends in the following queries to be answered in these pages.

1. What is the cause of enlargement of hock in colts six to eight months old with no lameness, no history or evidences of injury, and no navel infection within the knowledge of the owner?

Will the enlargement subside eventually?

2. Kindly outline a good treatment for worms, i. e., ascarides megalocephala and sclerostoma tetracanthum in colts with dosage according to age?

3. Has melted lard purgative properties equal to linseed oil?

Does it act quicker than oil?

Fashions in Treatment

When talking to his lady friends mere man is apt to talk in a superior way about woman's subservience to the changing fashion of the day; but notwithstanding man's assumed superiority, how few of us there are who are not slaves to fashion! It may be that the fashionable treatment is old—one might almost call it antique in some cases—and in discussion we may have not a good word to say for it so far as demonstrable value goes, but yet we hang to it and continue to use it. Professor Cushney in his "Manual of Pharmacology" tells of the early use of the silver salts in nervous diseases. In the time of the ancient Arabian astrologers it was the custom to associate the various metals with the various planets and heavenly bodies, and silver was thus considered to be related to the moon. This explains the origin of the name "lunar caustic" for silver nitrate. But further, these wise men of the East found that there was some definite connection between the phases of the moon and relapses or decrease of symptoms shown by lunatics. Silver was related to the moon; the moon had a bearing on lunacy or mental disease; *ergo*, said the astrologers, silver and its salts must be the appropriate remedies for lunatics. And the remarkable thing is, that with practically no evidence of its value or any benefit from its use, silver in the form of the oxide and nitrate is still administered in mental and nervous diseases—for so is the custom, and who shall break it?

It is true there are a few iconoclasts who may be heard to affirm that medicines are of no use whatsoever in the treatment of disease. Of this school was one who said, "Throw physic to the dogs—that is if the dogs are a nuisance and you want to get rid of them." But, seriously, is there not need for more serious thought in the selecting and prescribing of medicines? One of the glaring faults of our veterinary curriculum is the time—we will not say wasted—misspent in learning materia medica, the origin botanical or mineral, the manufacture and preparation, and the strength of numerous tinctures, essences, liquors and pills, whilst the real mode of action, the pharmacology or applied physiology of the drugs in every-day use is made less of than it deserves. Hence the professional empiricism which is all too common.

But fashion may not only preserve useless and indefensible remedies, it is sometimes responsible for the total disuse of remedies and methods anything but useless. No one would now be found to urge the repeated and promiscuous blood-letting practised a hundred years ago. In the *Modern Farrier*, published in 1827, we read, regarding the treatment of "murram" in cattle, "immediately on refusing fodder the beasts should have three quarts of blood taken away; and after twelve hours two quarts more; after the next twelve hours, about three pints may be let out; and after the following twelve hours, diminish a pint of blood from the quantity taken away at the preceding blood-letting; lastly about a single pint should be taken away in less than twelve hours after the former bleeding; when the worst symptoms will, it is hoped, abate." Now this was heroic, but that is the only virtue it possessed; but have we not in modern practice gone to the other extreme in refusing, practically, to bleed our patients at all. Fashion which formerly decreed "bleeding" in almost *all* cases, now commands "bleeding in *none*," and few of the younger generation have ever attempted the use of the once ubiquitous fleam.

Has blood-letting any value in the present-day practice of medicine? We believe it has, and we should welcome the experiences of those of our readers who have practised it. Among other conditions where its use appears warranted we may mention two, namely, laminitis and passive congestion of the lungs. In laminitis, affecting a plethoric animal, heavy-topped, fat, with full-bounding pulse, and with no complications, we should not hesitate to bleed early. Again, when the lungs are engorged and overtaxed as a result of a fast run in an unconditioned and unfit horse, the readiest means of relieving the right side of the heart is to bleed from the jugular vein.

Will some of our experienced readers give us the benefit of their observations on the subject?—H. A. WOODRUFF, M. R. C. V. S., in *Veterinary News*, London.

Opposes the Auto

I have read a great many articles in your journal in regard to the automobile. Some seem to think it the only thing and that every practitioner should have one, while others think just the reverse.

There is no use of a person trying to stop the progress of the times, but in my own mind they have hurt the veterinarian more than some seem to think. I own one of the things myself, and I have spent about fifteen hundred dollars on it in the last nine months; that includes first cost, and repairs, and everything. Those fifteen hundred dollars have been spent among a class of people of which I never have received one cent in return.

If I had spent that amount among farmers and horse men I know I would have secured a good return for my money. One thing I have noticed: in driving an automobile nobody seems to know you as you go along at such a fast clip; no one likes to stop a man in a

machine even if he has important business with him. I drive a horse on all my short trips and find it a great deal more satisfactory. Every one notices a good horse, and my advice to every veterinarian is to stay with your driver if you can possibly cover the ground by that means.

Some say, get there in a hurry before the animal dies. I get only a few calls of this kind. I believe in a man being prompt and I don't waste any time along the road. This thing of a person getting it into his head he has to rush along at the rate of forty or fifty miles an hour is all a mistake. Such are not only taking big chances themselves but are endangering the public.

Los Angeles has made great strides in the last ten years; increased over two hundred thousand in population in that time; this great growth has helped to make all kinds of business good. If it hadn't been for that enormous growth of the city I know some of us would not have had such a prosperous time in practice.

I will say to all my brother practitioners: Do not boost the automobile business, but encourage the raising of fine horses. Some may not think just as I do on this subject, but I know they would change their minds if they had to pay some of my repair bills.

A. B. ELLIS, D. V. M.
Los Angeles, Cal.

Adrenalin in Azoturia

After reading Dr. Thompson's article in the November issue on his experience with adrenalin I feel moved to cite my experience with this agent.

In the first place I do not consider adrenalin chloride a proprietary medicine, because we know that it is the active, blood-pressure-raising principle of the suprarenal gland, while in the case of proprietary medicine we know nothing of its derivation and simply administer it in an empirical way, expecting certain clinical results.

My experience with adrenalin chloride in azoturia has been very different from the experience of Dr. Thompson. In fact, I look upon adrenalin chloride as my sheet anchor in the treatment of this dreaded disease. If you will allow me to say so, I believe that Dr. Thompson has expected too much of the drug in his case of azoturia. Furthermore, contrary to the opinion of our worthy editor, I believe that adrenalin is strongly indicated in azoturia.

Without taking the time necessary to discuss the theories advanced as to the pathology of azoturia I think we are all agreed that the line of treatment in this disease is (with few exceptions) depletion and elimination. We may secure elimination through different channels. In this trouble preferably through the intestinal and urinary tracts and through the sudoriferous glands. On account of its blood-pressure raising principle we secure greater and better diaphoresis by the administration of adrenalin chloride than by any other method known to me.

My treatment in azoturia is usually this: I first administer one to two ounces of adrenalin chloride

subcutaneously and see that the patient is well blanketed. Next I give an aloetic ball. Catheterization is performed, the rectum is unloaded and the animal is placed on diuretics such as potassium nitrate. I also give large doses of sodium bicarbonate three times daily. The affected muscles are rubbed with a good stimulating liniment three or four times daily. Of course the general comfort of the animal is looked after. The adrenalin treatment is repeated at intervals of four hours until improvement is shown and the animal is on its feet. In a large majority of the cases two or three doses are sufficient. Colicky pains are controlled by the use of chloral hydrate or cannabis indica.

I do not claim that this treatment will cure all cases of azoturia, but I do say that it is the most satisfactory treatment I have ever tried and that it will save as large a percentage of the cases as anything I know of. It has proven equally as successful in hands of other practitioners as it has in my own.

As a local hemostatic adrenalin has been very effective in my hands. I combine it with cocaine as a local anesthetic in all minor surgery. But I do not think that Dr. Thompson should expect satisfactory results from his adrenalin spray in the nostril when he had also given it internally and raised the blood pressure so that the blood was coursing through all the arteries and into the capillaries with increased force, combating, as you might say, his attempts to cause a local contraction of the blood vessels at a certain point.

Contrary to Dr. Thompson I believe that adrenalin is one of the most valuable remedies known to the veterinary profession and is one without which I should feel lost. Only the past week I was called to a case of hematuria in a cow which proved to be of cystic origin. An injection of a 1 to 5,000 solution of adrenalin chloride into the bladder brought most gratifying results—prompt recovery of the patient.

M. J. SMEAD, V. S., B. V. Sc.
Yale, Mich.

Needed in America

In England an itinerant farrier school has been established by the Wilts County Council for the purpose of giving technical instruction in farriery to the shoeing smiths and others interested in the horse in the County of Wilts. Mr. William Fleming Hayden, A. F. C. L., is the technical instructor in farriery for the county. The pupils are shown the correct method of shoeing every kind of horse that they are likely to have to deal with, and also taught how to adapt shoes to adnormal conditions of feet. At the conclusion of the school in each district a competition for County Council certificates is held, and in order to encourage regularity of attendance only those who have attended at least eight lessons are entitled to compete. The certificates are of two kinds: (*a*) Full certificate, "Master or Journeyman;" (*b*) "Apprentice's Certificate." Each kind consists of three grades, viz.: First class, highly commended and recommended. From time to time an examination may be held in connection with the Worshipful Company of Farriers, London, England, with a view to the registration of pupils (as registered shoeing smiths) on the books of the worshipful company. During the past five years the Farriery School, under the charge of Mr. William F. Hayden, A. F. C. L., has visited twenty-eight districts, ninety-eight courses of lessons have been given,

and over 400 pupils have received technical instructions on practical and theoretical farriery. Such schools in this country would be of inestimable benefit to the horse interests, for there is no branch of the industrial arts in which ignorance can result in as much injury and suffering to a useful servant of man as in that of horse shoeing. Indeed, it may be said that in no other profession connected with the horse interests is the door left so wide open to incompetents, for in many cases the apprentice of a man entirely ignorant of the anatomy of the horse's foot and leg branches out for himself knowing no more than his instructor, and proceeds to shoe the feet of such horses as may be brought to him with a disregard for correct principles of the work that would scarcely be tolerated in any other profession.

—*Spirit of the West.*

The Horse Will Stay

"While a thousand factories are striving night and day to put new kinks in the automobile, and while every bright boy's backyard boasts the aeroplane of the era in course of construction, it must not be thought that the devotees of the horse and of horse breeding are dying out in the land. Horses are higher in price than ever before; and not only do the zealots of the trotter and the pacer constantly toil to lengthen their legs, heighten their spirit and increase their stamina, but the heavy Percherons and the light draft horse fitted for phaeton or victoria are also being improved by scientific selection on the many stock farms which make a specialty of breeding some one of the desired types," sapiently observes the *New York Sun*. And thus will it ever be. The genius of man is as unlimited as eternity, and it will continue to be manifested in methods of locomotion as yet undreamed of, and as strange as anything which has already come to pass, but the horse will continue to be bred and preserve his usefulness to man, both in the realm of sport and utility. The automobile will endure, so far as its utilitarian capacity is concerned, but as a fad it will in the near future abdicate in favor of the aeroplane.

—*Spirit of the West.*

Automobiles Displaced by Horses

The Wells Fargo Express Co., after giving up all its horses, substituted automobiles. At the time, it was another harbinger of the "horseless age." Now the Wells Fargo Express Co. has given up its automobiles and returned to the use of horses. Is the company, in the language of the day, retrogressive?

—*Rider and Driver.*

Sudden Death From Autointoxication

By J. H. and R. Bennett, Romford, Eng.

The subject was a valuable young Jersey bull, aged about one and one-half years. The bull was apparently in good health at 8 p. m., and took his evening meal as usual. An hour later he was observed by the attendant to blow slightly and show signs of distress; the symptoms rapidly became worse and death occurred in about one and one-half to two hours after the animal was first noticed to be ill. By the following morning the carcass showed all the signs usually supposed to indicate anthrax, i. e., discharge of blood from the anus; was much distended and rapidly undergoing putrefaction. We removed an ear and examined smear preparations for anthrax, but a good deal to our surprise no evidence of that disease was found; in fact, no bacteria were discovered in the blood at all. The blood, however, was, obviously even to the naked eye, very poor and watery, and microscopic examination showed anisocytosis; and also a noticeable excess of leukocytes to

be present, particularly of the polynuclear variety.

A postmortem examination of the viscera was then made and the following lesions were found:

Old-standing tubercular affection of the mediastinal and tracheal lymphatic glands, and one large focus in the anterior lobe of the left lung. All these lesions showed calcareous degeneration. There were no miliary tubercles and no affection of the pleura.

The bowels were much inflamed in patches, with hemorrhagic spots visible through the muscular coat. On opening the bowels the mucous membrane was found to be much congested and several tubercular patches were found in the small intestine.

The spleen was normal in size and appearance.

The liver was shrunken up to about one-half its normal size and showed very extensive fatty degeneration, practically all the normal liver tissues having disappeared.

The kidneys were somewhat pale in color but showed no tubercles.

The peritoneum was quite healthy.

The most curious feature of the case was that the bull appeared quite in good health up to the time of its death.

Sudden death from tuberculosis with such a distribution as in this case would appear very rare; at least, it is so in our experience, especially without any history of previous illness. We would suggest that the sudden death might have been due to an accumulation of toxins within the body owing to the disease having thrown the excretory organs out of working order. We shall be glad to hear whether any of your readers have had any similar cases, or whether they can suggest any other cause for the sudden collapse of the animal.—*The Veterinary News.*

Ordinance No. 17 in Chestertown, Maryland

To protect the health of the citizens of Chestertown from tuberculosis through milk from tuberculous cows

Be it enacted and ordained, That all dairymen, owners or dealers selling or offering for sale milk or cream within the corporate limits of Chestertown shall by the first day of May, 1911, and yearly thereafter, file with the Clerk to the Board of Town Commissioners a certificate from a duly qualified veterinarian certifying that his or her cattle, cow or cows have been subjected to the tuberculin test for tuberculosis within the previous twelve months and are free from tuberculosis.

And be it further enacted, That this ordinance shall apply to all cows from which milk or cream is bought to be distributed by said dairymen or dealers.

Such certificate of health shall constitute a license to sell milk or cream within the corporate limits of Chestertown for the period of one year from the date thereof.

Any person, firm or corporate body violating the provisions of this ordinance shall for each offence be subject to a fine of not less than $10.00 or more than $25.00 and the costs of prosecution. Such fine and costs to be collected as provided by law.

Signed and sealed by the Commissioners of Chestertown on this 11th day of January, 1911.—*The Enterprise.*

The *Kent News*, another Chestertown paper, speaks of this ordinance as follows:

"One of the most important acts in the history of the town commissioners is an ordinance which they have passed requiring a tuberculin test of cows from which milk is served to citizens of the

town. Healthy cows will mean healthier people, and when this test is enforced throughout the State and county, tuberculosis will be very much lessened. To Dr. G. Allen Jarman is due much of the credit for the agitation of this question. The public generally should encourage the enforcement of this act."

Cantharides Ointment
(Veterinary)

Cantharides, powdered	3 av. oz.
Gum euphorbium, powd.	1½ av. oz.
Soft turpentine	3 av. oz.
Yellow wax	1½ av. oz.
Olive oil	3 av. oz.
Lard	3 av. oz.

Mix the cantharides, oil and lard, heat on a water bath, and keep warm for ten hours, stirring occasionally, add the wax and turpentine, and, when melted, remove from the water bath, add the euphorbium, and stir the mixture frequently until cold.

—*Physicians Drug News.*

Cocaine Ointment

Cocaine	grs. 20
Oleic acid	grs. 80
Lard	grs. 400

Triturate the cocaine with the acid, gently warm the mixture till cocaine is dissolved, and then incorporate the lard.

Uses: Local anesthetic over inflamed nerves and in painful conditions of the rectum, urethra, eye and nose.—*Physicians Drug News.*.

Morning Musings

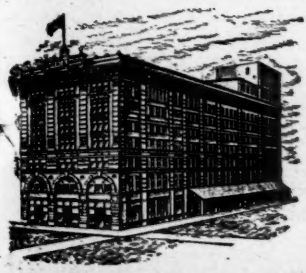
Scrape Scrape! Scrape!
Each morning I have to shave,
And then with a tonic to coax the hair
The top of my head I lave.
And this is the song I spin
While giving the blade a shove:—
"Why can't I be bald upon my chin,
And have whiskers that grow above?"

—*N. Y. Telegram.*

A Difficult Case to Diagnose

Subject, large aged mare heavy with foal. This mare was worked with two other horses in cleaning irrigation laterals which required rather heavy pulling. She was apparently normal at noon, but refused both water and feed at night

IT'S THE BEST
THE BALL BULB
VETERINARY THERMOMETER
Each in cardboard box 75c; per dozen $7.00
Edward P. Dolbey & Co.
Importers and Dealers in
Microscopes Laboratory Apparatus
3613 Woodland Avenue PHILADELPHIA, PA.



EIMER & AMEND
205-211 Third Ave., NEW YORK
Make a Specialty of all Drugs, Extracts, Tinctures, Chemicals, etc., etc., used in Veterinary Practice.
Sulfglycerole—for Skin Lesions.
Sulfglycerole Ointment—for Scratches.
Veterinary Glycerine Suppositories.
New York Agency for Bunton Drug Co.'s Hypodermic Veterinary Tablets.
We carry a very Comprehensive Stock of Laboratory Glassware and Apparatus, Chemically Pure Chemicals, and Bacteriological Apparatus.
Catalogue "V. M." gladly sent on request.

When writing Advertisers, please mention American Journal of Veterinary Medicine

and I found her considerably depressed and perspiring some on the neck and in the flanks. When I was called to see her about eight p. m., the temperature and respiration were normal and there was a slightly accelerated pulse.

The mare was given a mild cathartic and a stimulating draught of aromatic spirits ammonia and nux vomica and seemed very much improved one hour later when I left her for the night.

The owner called me again at 5:30 a. m. I found mare greatly distressed with profuse perspiration but temperature was still normal, pulse and respiration considerably increased. Some trembling and occasional straining was noticed; also some serous discharge from nostrils. Mare was given more stimulants and a hypodermic injection of morphine and atropine with no apparent results. She died two hours later.

Autopsy revealed three-inch rupture in pyloric portion of stomach surrounded by considerable inflammation, indicating that it had occurred at least twelve or fifteen hours previous. There was also a large amount of fluid in abdominal cavity with some peritonitis.

I think probably the mare had gorged her stomach with water and then in pulling ruptured it, being heavy with foal also causing additional pressure.

I believe the profuse perspiration accounts for no rise in temperature.

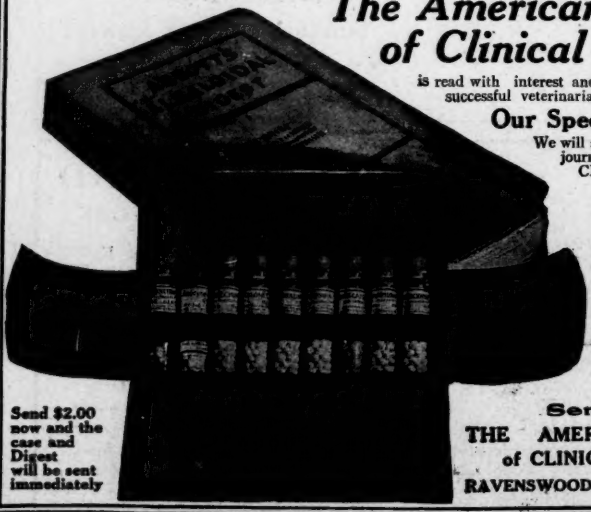
A. G. WADLEIGH, D. V. S.
La Junta, Colo.

You Can Have This Case and Digest Free

With one year's subscription to the Biggest and Best medical journal published. We say so and we'll prove it to you. Money back if not satisfied.

The American Journal of Clinical Medicine

is read with interest and profit by hundreds of successful veterinarians. **READ**



Send $2.00 now and the case and Digest will be sent immediately

Our Special Proposition

We will send to any reader of this journal CLINICAL MEDICINE for three months as a trial. If you like it, after a three months' trial send $2.00 covering the years subscription and we will send you free and prepaid, our handsome nine-vial leather pocket case filled with standard active principles, especially filled for veterinary practice, and a practical 300-page Digest of Positive Therapeutics, as above illustrated.—Don't miss this opportunity.

Send Now!

THE AMERICAN JOURNAL of CLINICAL MEDICINE

RAVENSWOOD, CHICAGO

A Legend of a Horse

One day, as the fast train from San Francisco to San Jose rumbled around a sharp curve just outside the city of San Jose, a white horse sprang on the track and raced down toward the town in front of the engine. For a mile the train did not gain on him. Then the unequal footing of the cross-ties and the pace began to tell on the white steed, and the engine crept slowly up to him.

The pilot struck him, ground the life out of him in an instant, says the San Francisco *Examiner*, and then plowed into dirt on the opposite side of the track. The engineer swore a few choice oaths and jumped out of the cab. The horse was as dead as a door nail and the engine had left the rails.

It was Vasquez's horse. The whole country knew it next day. He was twenty years old and totally blind when he met his death in front of the freight train, and for ten years had roamed over the unoccupied land about the lower part of Santa Clara county, free as a bird and feared by the Mexicans more than a lion. He was called by them the "White Devil," and it was their belief that he was possessed of a soul mortgaged to the evil one —the soul of Vasquez. It is a strange tale that the old Mexican mothers tell of this white horse.

Vasquez was the worst bandit of California twenty years ago. He bid defiance to the law, eluded the detectives and searching parties for years, and killed and robbed half a hundred men. He roamed over the State of California from the north to the south, leaving desolation and death in his wake. He surrounded himself with a band of desperate Mexicans and terrorized entire communities.

Vasquez made history in this way for five years, and then was caught in a trap in an abode house near the scene of a robbery of the mayor of Los Angeles, and was shot down by a newspaper correspondent detailed to accompany the search party. He survived his wounds and was taken to San Jose, where one of his earliest and most atrocious murders had been committed, and here met his death on the scaffold.

The night after Vasquez was hanged a white horse galloped up the street to the jail, stood a moment at the door and gave a neigh. The Mexicans heard in it a call to the dead Vasquez. There came no answer to the horse's challenge, and he wheeled about and went as suddenly as he came.

Then he turned bandit and followed Vasquez' old trails. Once in a while a man would be found on the road with his body frightfully mutilated and his flesh bearing the marks of hoofs. Sometimes in the night a white horse would appear at the door of a Mexican cabin in some lonely spot and neigh. If no answer came he would be off like the wind, but if any man dare show himself the horse would attack with hoof and teeth, and it was seldom that a victim escaped.

Time and again he was shot at, and one Mexican buck was foolhardy enough to try to rope him and met a horrible death. The horse bore a charmed life. He became almost as much of a terror to the Mexicans as Vasquez had been to the rich Americans. If by chance a Mexican pony got out of the corral and wandered off in search of grass the white horse would find him and enlist him. First he had one follower, then two, then half a dozen. No man would kill them, and no man dared to attempt to capture them. With no loads upon their backs they were as fleet as the wind and could outstrip the best horse with a rider. The Mexicans named the leader the "White Devil," and said that Vasquez lived again in his horse. As the years went by and Vasquez became a memory, and his exploits a theme for children's stories, the "White Devil" lost his companions. His visits to the vicinity of little towns became less and less frequent, and then ceased altogether. At long intervals a Mexican would ride in with a report that he had seen the "White Devil" in some canyon among the hills. Even these reports ceased, and a few Americans of the latter days in California had heard of him until the freight train had killed the white horse. The Mexicans came for miles to look at him. All of them knew him, at least they said so, and they respected him sufficiently to look at his dead body from a distance.—*Spirit of the West.*

Radium May Be Elixir of Life

The rejuvenating qualities in radium have been discovered by Prof. Gabriel Petit of the veterinary school at Alfort, France. He injected two milligrams twice in the jugular vein of an old horse with surprising effect.

The animal seemed immediately to gain a new lease of life. It put on flesh and became frisky. Considerable traces of sulphate of radium appeared in the blood. The red globules increased in number.

The injections, Dr. Petit says, produced a lasting radioactivity of the system.—*Chicago Tribune.*

Hog Cholera Serum

Dr. C. J. Sihler president of the Sihler Hog Cholera Serum Co. is widely known among veterinarians of the Middle West. He has been located in Kansas City for more than twenty years and has enjoyed a large practice there.

The Federal inspection of meat at the Kansas City packing houses was inaugurated by Dr. Sihler. He was also one of the founders of the Kansas City Veterinary College, but severed his connection with that institution many years ago.

The Sihler Serum Company is the outgrowth of the founding of a big hog ranch two years ago. It was found necessary to use great quantities of serum on this ranch and in this way Dr. Sihler was led into the manufacture of hog-cholera serum.

The growth of the business, particularly the increasing sales for immune pure bred boars and brood sows necessitated the manufacture of the serum in large quantities. With the facilities at hand for producing the serum it required little additional effort to increase the output to meet market demands.

DR. C. J. SIHLER, Pres. F. G. MAC DONALD, Treas.

The Sihler Hog Cholera Serum Co.

MANUFACTURERS OF HIGH POTENCY
THOROUGHLY RELIABLE
HOG CHOLERA SERUM

This Serum is distributed through veterinarians only.

Our plant is conveniently located to the second largest stockyards in the world where opportunity for securing material is unequaled. Our facilities for producing a serum of the highest quality are unexcelled.

We ship no serum, the potency of which has not been fully proven on our own ranch.

Full directions for use with all shipments. Information upon request.

NOTE:—We supply pure bred inmune boars and brood sows.

THE SIHLER HOG CHOLERA SERUM CO.

501 Live Stock Exchange KANSAS CITY, MO.

When writing Advertisers, please mention American Journal of Veterinary Medicine

American "Spy" Arrested

Dr. Lloyd Champlain who was arrested at St. Petersport, on the island of Guernsey, Jan. 15, was released with apologies the following day.

Dr. Champlain was wandering about the island, and strolled into the fortifications carrying a camera without any attempt at concealment. He was stopped by a sentinel and closely questioned but said he was merely studying English dairy methods and had been photographing a number of cows. He added he cared nothing about the fortifications and paid no attention to them.

In spite of this he was detained and his camera and photographs were confiscated. An examination of the plates showed that the American editor had told the truth, as all his pictures were of cows.

After two hours' delay the military commander sent the doctor to the local police with a written report of all the circumstances.

Dr. Champlain's statement was taken and he was released on bail. Today he was in police court with several witnesses and was discharged with an apology. His camera and plates were restored.

Dr. Champlain is known in America for his campaign for pure milk and pure food. He is now investigating Europe's way of dealing with this problem.

The above from the *Chicago Tribune* will be well understood by Dr. Champlain's many friends.

Possibly a mail censorship is responsible for the absence of the Doctor's monthly letter from this issue of VETERINARY MEDICINE.

Occurrences of Interest

Dr. J. M. Wright, State Veterinarian of Illinois, was operated upon recently for the relief of appendicitis.

Drs. Boor and Hamilton, Muncie, Ind., have just equipped one of the finest hospitals in the state.

"Thigenol" treatment of

Scratches, Grease Heel, Mange, Eczema, Phlegmon, Malanders, etc., is

Rational sulphur therapy

"When veterinarians learn the value of Thigenol as a remedy for many of the ills our domestic animals are heir to, they will never be without a supply. It is nothing short of a specific for conditions known as scratches, grease heel and eczema (all stages) in dogs." *So declares a well-known instructor in Veterinary Science at a certain State University, and he speaks from experience.*

Thigenol Roche is an organic sulphur compound, and mixes freely with water, dilute alcohol, glycerine, vaseline, lanolin and zinc ointment.

Antiparasitic, Antiphlogistic, Antipruritic

Odorless on use and non-staining. All the virtues of ichthyol without its drawbacks. **Send for sample and literature.**

The Hoffmann-LaRoche Chemical Works
65 Fulton Street, New York

When writing Advertisers, please mention American Journal of Veterinary Medicine

The Texas Veterinary Medical Association is making an effort to secure improved legislation, governing veterinary practice in that state.

There is a contest on before the Kansas legislature as to whether the Veterinary Department of the Agricultural College or the live stock sanitary commissioner shall receive the appropriation for the manufacture of hog cholera serum.

Work is progressing finely on the new $150,000 veterinary building of the Iowa State College at Ames, Ia.

Dr. Cook of the Cincinnati Veterinary College is authority for the statement that there are in Ohio 220 graduated veterinarians who are legal practitioners, 146 graduates who are illegal practitioners, 79 non-graduates who are legal practitioners and 781 non-graduates who are illegal practitioners, with some counties yet to hear from.

The Ohio State Veterinary Association spent one day of their annual meeting at the state house lobbying to prevent the reopening of the Veterinary Practice act.

AIR CUSHION RUBBER HORSE-SHOE

No Lameness

PADS

No Slipping

They fill with air at each step.
That's what breaks concussion.
That's what prevents slipping.
That's what keeps the foot healthy.
That's what cures lameness.

SEE THAT CUSHION?

Order through your horse-shoer

Revere Rubber Co.

SOLE MANUFACTURERS

BOSTON NEW YORK CHICAGO

Order by "NAME"

The Secrets of Specialists

By DALE COVEY, M. D.

330 pages.
Bound in Cloth.
Price $3.50. Delivery Prepaid if you mention Veterinary Medicine when writing.

PHYSICIANS DRUG NEWS
NEWARK, N. J.

THIS book was written for the use of physicians but it contains much that is equally as important for veterinarians to know. It incorporates more money-making specialties than any other book of its kind ever published.

This publication contains most of the latest secret methods of treatment used by the TRAVELING, LOCAL, SPECIAL DISEASE, MAIL ORDER, OBSERVING, (diagnosing without asking questions) ETHICAL and OFFICE SPECIALISTS. Gives treatment of ALCOHOLISM and DRUG HABITS, as used at high class institutes; gives the INJECTION and other treatments for HERNIA and RECTAL DISEASES. Many new methods of treatment used by the GENITO-URINARY and GYNAECOLOGICAL SPECIALISTS, the treatment of the BEAUTY SPECIALISTS; the methods used by "PAINLESS DENTISTS" and their formulae. HYPNOTISM IS FULLY EXPLAINED. Gives the treatment used by the TAPE WORM, STAMMERING, HYDROPHOBIA and HYGIENIC SPECIALISTS. Tells of SECRET PRESCRIPTION WRITING.

It gives the published formulae of over 475 PATENT MEDICINES, etc. This is the LATEST and MOST COMPLETE BOOK EVER PUBLISHED ON OFFICE SPECIALTIES. Contains over 300 pages, bound in cloth, fully illustrated with half-tones and etchings.